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WILDLIFE
On The Public Lands

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Introduction

Hundreds of feet above the flat Idaho plain, a sharp-eyed prairie falcon scans the sagebrush below, searching for a ground squirrel to feed his nest of young. The afternoon sun bakes down upon the sagebrush, now gray-green in early summer.

Beneath the sagebrush, closer to the dry soil, live the grasses and forbs that feed the falcon's prey. Nearby, a herd of cattle seeks the summer grasses. In the distance, over the Owyhee Mountains to the west, a thunderstorm rages. It may or may not bring some of the 12 inches of moisture upon which this high desert depends each year.

Four hundred miles to the west, a rainbow trout rises to what she senses is a tasty morsel. But it is not a mayfly. After a brief and hard-fought struggle, she ends her life at the fisherman's hand, the imitation Mayfly nymph still hooked in her jaw.

The cold, clean water she left behind continues to run, sheltered by towering Douglas fir and shorter alders, fed by melt from last winter's 50-inch snows that blanketed the western ridges of the Cascade Range in Oregon. Nearby, a whistle signals the end of the logger's day.

Again, 800 miles to the south, across Nevada to the southern desert of Arizona, a coyote lopes through the late twilight, past fingerlike ocotilla and saguaro cactus. A kangaroo rat, scampering from his daytime burrow toward his evening meal of grass seeds, becomes in turn the evening meal for a hungry coyote.

It rained here last year, and might not rain again until next year. As twilight fades, the only illumination competing with the stars is that of a camper's lantern, alone in the priceless solitude.

Leap 3,000 miles to the north, long after June twilight has closed in upon Arizona's deserts. Here in Alaska's Yukon Basin, a few degrees of latitude south of the midnight sun, a grizzly bear wades the shallows of the Porcupine River. With one swipe of his paw, the grizzly stuns a female salmon, then rests on the riverbank to finish his dinner.

The bear sniffs, then ignores the smoke from a miner's camp a mile away. Overhead, a bald eagle patiently circles, waiting for the left-overs of the grizzly's dinner. The river flows on, fed by glacial melt of snows, reinforced by seepage from permafrost that still lies frozen a few inches below the moss-covered surface of the soil.

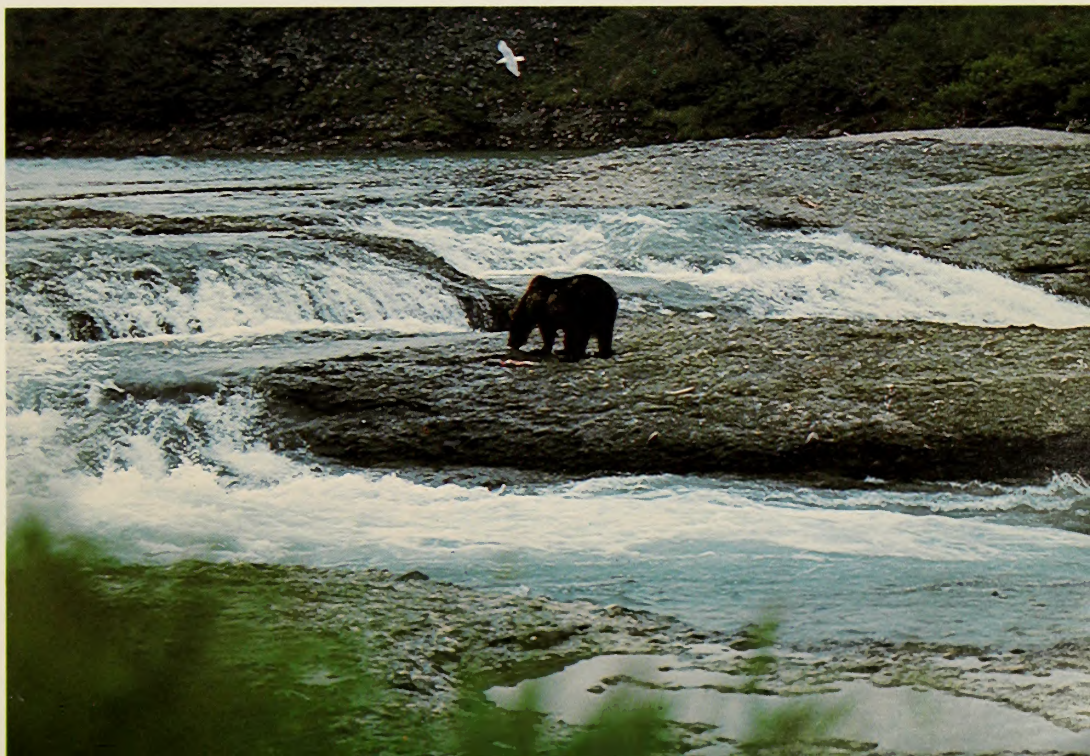
What do all these animals have in common? They inhabit distinctly different habitats, hundreds and thousands of miles apart, with dramatically different climates, rainfall, and man-made influences. They are products of their diverse habitats.

There is a connection. These are all wildlife of the public lands managed by the Interior Department's Bureau of Land Management. And, they are all part of our Nation's wildlife heritage. BLM, as it is more commonly known, is the manager of nearly 327 million acres of federally owned lands and the wildlife habitats these lands provide.

With the exception of federally listed threatened and endangered species, BLM does not manage wildlife species directly. That responsibility rests with the fish and wildlife agencies of the respective State governments.

BLM, on the other hand, does manage the diverse and abundant wildlife habitats on these lands, usually on a partnership basis with the States. How it performs this role, its objectives and its programs, is what this booklet is all about.

Alaskan brown bear collects a meal during the annual salmon run.



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Wildlife Habitat Management on Public Lands

BLM scientists measure forage for deer in an exclosure that keeps cattle out but deer can get in.

The Bureau of Land Management, among the Federal land-managing agencies, has the most complex and diversified task of all.

From the Louisiana Purchase in 1803 to the passage of the Taylor Grazing Act in 1934, the Federal government has been custodian of vast acreages, the remainder of the Nation's legacy, the public domain lands. But during that long era, the only objective was to dispose of the land, not to manage it.

And dispose of it they did. More than *one billion acres* of the Nation's two-and-one-half billion acre land area were homesteaded, granted to States and railroads and land-grant colleges, or set aside for military and Indian reservations and other federal uses such as national parks and forests and wildlife refuges. Yet there remain some 327 million acres of public domain lands—one-seventh of the Nation's land area.

In 1946 the Bureau of Land Management was formed to manage these remaining lands. These lands are scattered from Arizona to Alaska, occupying a substantial part of the western United States. There are even some lands in the midwest and south, in isolated holdings.

In the years since BLM was formed, its role has slowly shifted from one of passive custodian to that of active manager. Its responsibilities have been increased by Congress; no longer do its actions affect only the western rancher, logger and miner. Now BLM's decisions are important to all of us, wherever we live and whatever we do.

Pronghorn antelope are undisturbed by oil pumping operations on the Wyoming plains.

As the Nation has become increasingly aware of the finite nature of its lands and resources, more and more people look to the public lands to obtain needed commodities—livestock products, lumber, oil and gas, and other natural resources. They also look to these lands as a source of many forms of recreation—and as habitat for wildlife.

But as much as land, the Bureau of Land Management is people—with varied skills, talents and experiences. Its employees work wherever BLM's activities take them, in Washington, D.C. and in field offices located primarily in the West. Scores of men and women are employed as wildlife and fisheries biologists, professionally trained to plan and carry out fish and wildlife habitat management programs.

A Multiple-Use Mission

The Congress of the United States has directed BLM to manage the public lands for *multiple uses*. This means that range specialists, foresters, wildlife and fisheries biologists, minerals specialists, hydrologists, soils experts and others must work together to produce the most benefits from these lands.

The multiple-use concept for management of the public lands has many facets, not all of them in terms of economic return. The aim of multiple-use management is to use public land resources in the best combination to meet the present and future needs of the American people.

In the Federal Land Policy and Management Act (FLPMA) Congress recognized principal, or

John Crawford

Cooperative projects with State wildlife agencies are vital to BLM's wildlife work.

major uses of these lands: domestic livestock grazing, fish and wildlife development and utilization, mineral exploration and production, rights-of-way, outdoor recreation, and timber production.

And Congress has called for "harmonious and coordinated management of the various resources wtihout permanent impairment of the productivity of the land and the quality of the environment" in its definition of mutiple use.

Making the wiser choice is seldom easy. With so many major uses recognized within the framework of multiple use, conflicts are inevitable. So, wildlife habitat management, as practiced by the Bureau of Land Management, must be coordinated with other resource programs to meet other needs. Frequently there must be compromise to reach the best solution to conflicting desires.

A Cooperative Approach

Fish and wildlife habitat management, as practiced by BLM, is a three-step process of fact-finding, planning and action. None of these steps can be effective without the cooperation of others; BLM must depend on the public, on private organizations, on other State and Federal agencies, and upon scientists from colleges and universities to contribute detailed knowledge and skills to these tasks.

Cooperating with State Fish and Game Agencies

There is a fine but important distinction between managing *wildlife* and managing *wildlife habitat*. The Federal government, as the custodian of the land, has a broad responsibility to the public to maintain and improve the habitat or "home" for wildlife. But, except in special cases, the responsibility for managing the wildlife itself traditionally rests with the individual States.

There are exceptions. Marine mammals, migratory birds, and the federally listed threatened and endangered species have become, at least in part, the responsibility of the Federal government.

The States set seasons, limits, and license fees for harvesting game birds, mammals and fish. They also conduct on-the-ground management and research for a variety of wildlife. including non-game species and species that are threatened and endangered.

While BLM and the fish and game agencies of the various States have been cooperating for many years, the extent of cooperation and the degree of understanding has increased markedly since Congress passed an amendment to the Sikes Act in 1974. This act requires that BLM work jointly with States in developing cooperative projects on BLM-administered lands. Cooperative agreements have been signed with all States where BLM administers substantial land areas, and dozens of cooperative habitat management programs have been implemented as a result.

A Community of Interests on the Land

The fabric of the environment is finely woven. Tug a thread here, and something moves over there. And while much has been learned about the interrelationships of the land and its inhabitants, much remains to be discovered. Many people, in many walks of life, are interested in this knowledge for a variety of reasons.

The wealth of knowledge acquired over the years becomes even more valuable when shared. Thus BLM tries to share the knowledge of its employees through scientific and technical publications and other means, and to use information gained by others.

One example is in the concern for rare and endangered species.

Species become threatened or endangered mainly through loss of habitat. A highly tolerant species such as the blue mussel can thrive along ocean shores from the Equator to the Arctic. But when a species requires a highly specialized habitat, such as the tiny desert springs where the desert pupfish dwell, it lives a fragile and precarious existence.

The Bureau must look to the scientific community to provide much of the knowledge of threatened and endangered species. The Federal government, through the Fish and Wildlife Service and other agencies such as BLM, continually monitors some of the more prominent endangered species—but in many cases, BLM must initiate research to gain the information it needs.

In most programs, especially those related to new energy development, the Bureau must explore new frontiers in research and technology.

Among its many duties, BLM is responsible for leasing offshore tracts for oil and gas development. To know where you're going, you often need to find out where you've been. Such is the case with the intricate chains of life found along the Nation's outer continental shelf. So, BLM is developing a series of "baseline" studies to obtain data on marine plants and animals, water quality and other factors that could be affected by oil and gas development offshore and by the associated ports and terminals that will be needed onshore.

The baseline studies are examining existing social, economic and biological conditions to provide yardsticks against which future changes can be measured.

For example, a marine biologist spent two winters inventorying whales, porpoises and marine turtles off the North Carolina coast. All of these species are protected, some are threatened or endangered. The biologist hitched rides on small commercial trawlers, on Coast Guard aircraft and vessels, and even used a rowboat to conduct close investigations in the stormy winter sea between Cape Hatteras and Cape Lookout.

Other techniques are borrowed from other technologies. The Bureau frequently uses infrared photographs from satellites to examine vast tracts of public land for the purpose of inventorying vegetative types, one key to wildlife habitat management.

Wildlife Habitat and the Search for Energy

BLM is the leasing agency for the Federal government in all mineral activities, including coal, geothermal energy, uranium, oil, gas and oil shale. Many energy-related programs demand the attention of the Bureau's wildlife staff.

In all of its varied energy leasing activities, BLM must consider the impact of man's development upon fish and wildlife habitat. Sometimes, because of the urgency of domestic energy programs as part of the Nation's highest priorities, some wildlife habitat must be sacrificed—at least temporarily. But it need not be lost forever.

Take the Powder River Basin in Wyoming and Montana. The Basin is an ancient seabed which later became a huge inland swamp. Layer upon layer of peat was deposited, which became a low-grade form of coal after the passage of millions of years. While this coal is not high in energy, it is low in sulphur—and thus can be mixed with Appalachian coal to form a low-polluting fuel for urban power plants.

To utilize this abundant source of energy, several large strip mines have been opened on federally leased lands. One such strip mine is in the Decker-Birney area of southeastern Montana, just north of the Wyoming border.

Here, huge draglines scoop the topsoil and the rest of the overburden from the coal seam below, storing the topsoil in vast piles while the underlying coal seam is removed. Then, carefully, the topsoil is replaced, seeded and fertilized. As much as possible, the original contours of the land are restored. Land restoration goes on continuously, as the mine pit progresses across the land.

The principal big-game species of the area is pronghorn antelope. Within a few years after rehabilitation of the mined lands the native vegetation has recovered, and pronghorns and other wildlife forage within sight of the mining operations.

While the surface habitat affecting the antelope is readily restored, things aren't quite so easy for the complex chain of soil organisms and burrowing animals. But in time, these too will recover, as the needed process of mineral extraction and land management go hand in hand.

Wildlife habitat can be reestablished on strip-mined lands.

Don Wirth

Wildlife's Own Requirements

Excellent moose habitat on public lands in Wyoming's high country.

Look almost anywhere in the world and you'll find some wildlife species, surviving and even thriving under the harshest extremes of heat and cold, in the driest deserts, the wettest swamps, the deepest oceans. Yet, for each species there is a preferred habitat—a place to live which offers that particular combination of food, cover, water and living space essential to the animal's needs.

But even when the essential requirements are met, there are other *limiting factors* that prevent wildlife population explosions. Some of these factors are environmental; others, such as disease, are not. Predators help keep smaller animals in balance with their food supplies. A herd of undernourished deer will soon reach an equilibrium with its food supply as disease takes its toll. Sport hunting today is rarely responsible for driving a species to the brink of extinction. Rather it is often used as a management tool to help keep game animals in balance with their environment.

A major task of the wildlife habitat manager is to recognize the factors such as lack of food, cover or water that limit a species, and if possible to manipulate the habitat to improve conditions for that species.

Many times, choices have to be made. Improving habitat for one species may diminish its value for another. Competition between species for the same limited food supply often requires hard choices. Improving vegetation for antelope, for example, reduces the plants available for certain other creatures. But because BLM is committed to a multiple-use management policy, other land resources must be considered too.

Rangeland management programs benefiting domestic livestock can accommodate wildlife as well. Often it is simply necessary to regulate cattle numbers and periods of use so there is winter food left for wild animals. In timberlands, cover needs of nesting owls and other hole-nesting wildlife can be met by leaving some older trees while continuing an economically important timber harvesting program. Where water is critical, the

Mr. & Mrs. William Neitro

Spotted owl nesting sites in the rich timberlands of western Oregon are protected by buffer zones during lumbering operations.

Mule deer are the most plentiful big game animal on public lands. These two move toward winter range at lower elevation.

Nearly 85 percent of the desert bighorn in the U.S. live on the public lands.

needs of desert wildlife can sometimes be met by constructing simple catch-basins, covered with a roof to reduce evaporation of the precious water collected. Vegetation along stream banks and shorelines can be protected by fencing or by regulating domestic livestock use of the adjacent lands.

But other limiting factors may offer a greater challenge to State and Federal wildlife managers. *Territory* for hunting is a characteristic limiting factor of some animals such as the mountain lion or timber wolf. The need for *isolation* can be another limiting factor, as with bighorn sheep, or the spotted owl of Oregon.

The need for habitat *diversity* often limits the numbers and variety of wildlife. The greater the diversity of vegetation, the greater the variety of wildlife. The desert bighorn sheep is one species which has very specific habitat requirements, calling for a variety of land features located near each other. Desert bighorns can adjust their diets to those foods which are available. In southern Nevada they have been observed using at least 130 different plant species as food. And temporarily, at least, succulent vegetation can replace the need for free water. The bighorns will, however, congregate near summer waterholes after succulent vegetation dries out under summer heat. But while bighorns can eat many different plants, they prefer perennial grasses.

In summer, the bighorns seldom stray more than a mile from open water. Due to their shyness, they must have escape cover nearby. They seek a daytime bed in summer, shaded to protect them from desert heat.

Even in selecting a daytime bed, the bighorns are choosy; the wary animals want an unobstructed view of at least a portion of the surrounding terrain. And for all-important reproduction, they look for lambing areas in rugged, precipitous terrain.

So, while many thousands of acres could feed and provide water for these scarce animals, only limited areas have the unique combination of requirements of food, water, living space, daytime bedding, escape cover and protected lambing areas which the bighorns require.

When the basic facts of an animal's requirements are known, the wildlife or fisheries habitat manager works within these limitations to improve conditions. The biologists have to recognize when

Too many wild burros in the southwestern deserts compete with wildlife and livestock for scant forage.

proper conditions do exist, and plan around them. In the case of the scarce desert bighorn sheep, this may mean reducing conflicts between the bighorns and domestic livestock or wild burros over waterholes, and preventing human intrusions that would frighten the animals away.

Where the basic essentials of food, water, living space and cover have been met in abundance, the territorial ranges of some wild animals are often limited to an acre or two. For others, it may be thousands of acres. The public lands offer such species "room to roam" in vast tracts, and for this reason, certain animals thrive here, and do poorly elsewhere.

Take the spotted owl, for example. Despite ample rainfall and lush understory growth, this owl, a native of the west slope of the Cascades in the Northwest, requires a large territory of 300 acres or more of old-growth trees for a single pair. Its numbers are low in Oregon due to extensive cutting of old-growth timber, since this two-pound mouse-catcher simply won't tolerate many neighbors. In a joint BLM-Forest Service-Oregon Department of Fish and Wildlife program, some 380 sites have been located on Federal lands within the State. These are being managed, principally by reserving the sites from timber-harvesting until more information can be gathered.

The two-inch desert pupfish has different territorial requirements. Adapted to waters that may reach a summertime high of 120° F at the surface, these tiny fish dwell in only a few springs in the southwest desert. How they have survived remains a mystery. The principal threat to their existence is from changing land-use patterns that could destroy or cause their bathtub-size springs to dry up.

It took the use of miniature radio transmitters to establish the hunting range of prairie falcons in Idaho. While it was earlier thought that they hunted within only a mile or two of their nesting areas, the radio tracers proved that this species ranges as much as 15 miles from home to find food for its young.

Diversity of habitat often works to the benefit of two or more species that live on the same land. Each has its preferred foods, but will eat other foods if those are all that are available. When the land provides a mixture, there is enough for each species without competition.

John Crawford

BLM has established protected areas for the jeopardized desert tortoise.

In some areas, there are seemingly endless acres of mixed pinyon pine and juniper. Grasses, forbs and sagebrush grow in occasional openings in these low forests. Mule deer and domestic cattle compete for what succulent vegetation is available.

In a program aimed at improving the habitat for both wildlife and livestock, BLM has carried out efforts to open irregular strips and patches among the pinyon and juniper. Grasses, forbs and other food plants were seeded in place of the downed trees.

One of the benefits was created by miles of borders between the forest and the clearings. The so-called "edge effect" of these borders allows nearby escape cover should the wild creatures be disturbed, and provides protection from cold winter winds.

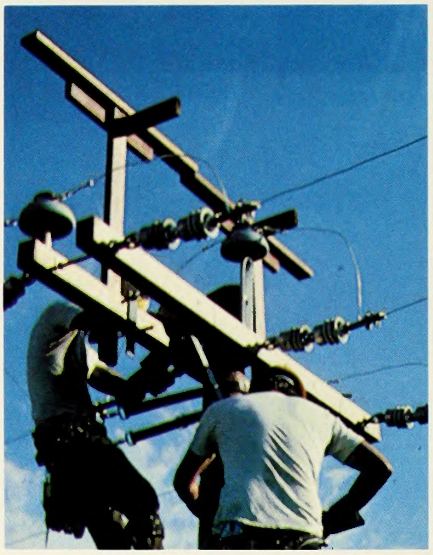
Now, the dynamics of the food supply have been altered, and both cattle and wildlife have their foods. As a bonus, the downed brush left lying around offers cover for countless small animals and birds.

Water as well as land can be improved for diversity. In Oregon, the South Fork of the John Day River was scoured almost clean of boulders, and its banks lost their shady vegetation, after years of overuse and sheet erosion on the watershed. In 1964, a winter storm almost finished the job of ruining a once-productive stream when it changed deep, narrow portions of the river into broad, shallow flats.

Four agencies became involved in efforts to rehabilitate the South Fork: BLM, the Forest Service, Oregon's Department of Fish and Wildlife, and the Soil Conservation Service.

The job called for both stream and watershed work. Two quarry sites were developed to provide rock for riprap and jetty construction. Careful engineering located jetties and diverted the stream flow

Among many wildlife habitat improvements made on the public lands: stream bank projects to reduce siltation; dams to stabilize stream flow; land restoration; and the construction of water holes, nesting island, and elevated perches to protect birds from live power lines. Other Federal agencies, citizens' groups, public land users, and State wildlife agencies often assist BLM.



in such a way that it would build up banks and deepen channels. Long stretches of unstable dirt banks were covered with cut juniper trees wired to stakes to trap passing silt during times of flood.

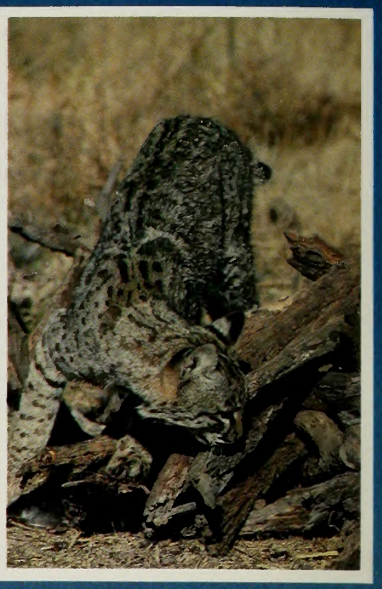
On the South Fork watershed, land managers cleared some 70 acres of juniper, supplying the brush to cover bare stream banks. The cleared areas were planted with shrubs and grasses to hold soil and to provide food for wildlife. These acres will attract deer and many other game and non-game wildlife that otherwise could damage newly planted stream-bank vegetation before it could become established.

The prairie pothole region in the northern prairies is part of the "waterfowl factory" for much of the duck and goose population of North America. But increasingly, large-scale farming has reduced the number of potholes available for nesting. BLM has attempted to improve nesting habitat for ducks and geese by creating artificial nesting islands in many of the lakes and ponds on public lands. Shorelines of reservoirs have also been protected from excessive livestock grazing to provide additional nesting habitat for waterfowl.

Montana's 120-acre Little Bear Lake, for example, dries up in winter, thus making it possible to create variably spaced mounds of soil with a bulldozer. BLM engineers made sure that a mantle of topsoil and vegetation was deposited on top of each mound. When the lake was flooded again by spring runoff, and the vegetation began to grow, conditions were then ideal for waterfowl to nest and rear their young on these islands without fear of predators.

BLM must manage the public lands for a variety of resource uses under the multiple-use concept set forth in the Federal Land policy and Management Act of 1976.

Monty Woody



James Talion

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BLM's Wildlife Program Process

BLM biologists "rope up" to inventory a red-tailed hawk's nest on a cliff ledge.

Wildlife habitat management is the end-product of a series of steps taken by Bureau of Land Management employees—and the people and agencies with whom they cooperate. Wherever the land, and whatever the species, the process begins with the question, "What do we have here?"

That question is answered by an *inventory*, itself an often time-consuming but revealing undertaking.

Once the inventory phase is completed, *planning* for habitat management begins. The planning phase involves consultation with State fish and game agencies, other Federal agencies, and with the public. It must also involve coordination with BLM plans for other resources, and conversely, coordination of other BLM resource efforts with the wildlife program. A fish or wildlife habitat manager does not plan an ambitious undertaking to improve big game habitat immediately on an area that is scheduled to be opened to coal leasing next year. But he does actively participate in other resource planning as spokesman for fish and wildlife resources when the Bureau formulates its plans—whether for range, forest, or mineral development.

Finally, after the inventory and planning phases are complete, *field actions* begin to take place.

Inventory of Wildlife Species and Crucial Habitat

Some of the best and most detailed inventories have come as a consequence of major proposals in other resource fields. The mammoth Trans-Alaska Pipeline, for example, was one of the first large proposals requiring an environmental impact statement under the National Environmental Policy Act. Studies of the probable impact on resident and migratory wildlife provided both BLM and the Alaska Department of Fish and Game with some of their more important basic inventory information. And the pipeline construction companies employed their own fish and wildlife biologists to assure that wildlife stipulations in the pipeline permit were properly followed. These biologists exchanged valuable information with State and Federal agencies, adding to the knowledge of all concerned.

But many other studies have been made without the haste and pressure of pending environmental decisions.

Roadrunner, an unusual bird of the southwest, feeds on small reptiles, rodents and insects.

Would caribou, a migratory artic deer, continue to use traditional routes crossed by the Alaskan pipeline? The answer: yes.

Two students recently spent a summer in Alaska's Gulkana River Basin as interns in a program sponsored by the Western Interstate Commission for Higher Education.

One of the students assembled a detailed inventory of the fisheries and fish habitat of the three forks of the Gulkana, while his associate studied the wildlife and wildlife habitat.

The Gulkana River drainage is of key importance to many of Alaska's residents. In a State where most of the terrain is roadless, any land accessible to hunting and any water open to fishing is important to the average sportsman. And the Gulkana is within reach of the metropolitan population of Anchorage, Alaska's largest city.

With the Denali Highway to Mt. McKinley on the north, the Richardson Highway on the east, and the Glenn Highway on the south, the entire drainage from the Gulkana Glacier to the river's confluence with the Copper River is significant to the resident Alaska sportsman and visitor alike.

Yet enough of the river remains in its pristine state that it has been nominated for "wild" status under the National Wild and Scenic Rivers Act.

Working together much of the time, the two interns repeatedly floated the river in a rubber raft, cataloging species of fish, birds and mammals along the way.

The interns' reports are veiled in scientific terminology. The fisheries student, for example, observed numerous *Oncorrhyncus tshawytscha* and *Thymallus articus*. But look again at the report; these are our old friends the king salmon and the Arctic grayling—names to savor on a cold winter's night when there's nothing to do but tie flies and conjure up dreams.

The wildlife biologist's report reveals what happens to many of the spawning king salmon. At an area set aside by the Alaska Department of Fish and Game north of Paxson, visitors can view

The last free-roaming herd of wild American buffalo in the lower 48 States live on public lands in Utah.

old humpback, the grizzly, in his natural habitat. Here, salmon carcasses line the river after the bears have feasted in August.

But the insights this inventory gives to the wildlife of this area go far beyond picture-postcards and scenic calendars. BLM now knows, for example, the foods on which these animals depend, as well as the problems they must meet to survive in the face of man-made pressures.

Conducting fish and wildlife inventories by rafting down a whitewater river in Alaska is a planned program, involving cooperation with educational institutions as well as the State. But in Montana, a Bureau biologist in the Lewistown District stumbled upon a new method for inventorying mating grounds, or "leks," for sharp-tailed grouse. It started with a stroke of bad luck—and ended with the most modern space-age technology.

He forgot his maps.

The biologist was using the traditional linear survey method—driving roads and trails, stopping every mile or so to listen for the booming sounds of displaying or courting sharp-tailed grouse taking part in a mating ritual imitated in many ancient Indian dances. But his surveys took him off the area covered by the standard topographic maps he had with him. He continued his plots, but used high-altitude color infrared maps he happened to have along.

It soon became apparent that the leks he was plotting showed conspicuously on the color infrared maps. Later, in comparing his on-the-ground field notes with the aerial photographs, he was able to locate 285 possible leks. Still later, checking back on the ground against suspected locations, he found that 62 percent of them were active.

But whether by luck or by design, what is important is that the new technique allowed one biologist to conduct a preliminary survey of 2.9 million acres of potential grouse habitat in one year—a major step forward in managing the habitat for this spectacular game bird.

In some cases the Bureau's approach is to inventory an area to

see what's there, as in the joint fish and wildlife inventory of the Gulkana River Basin in Alaska. But in other instances, especially those involving threatened or endangered species, the approach may be to seek signs of the animal wherever habitat appears suitable for its survival.

Consider the blunt-nosed leopard lizard, a somewhat colorful inhabitant restricted to California's San Joaquin Valley and the surrounding hills. If you don't count his tail, a big member of this species will measure five inches. He has few friends. He has many enemies. He feeds upon locusts, cicadas, and smaller lizards—including, sometimes, smaller blunt-nosed leopard lizards. In turn, he is fed upon by shrikes, owls, kestrels, roadrunners, spotted skunks and even coyotes. But his worst enemy is man.

Man has caused the blunt-nosed leopard lizard to be added to the endangered list. First, agricultural development used up much of his original range in the San Joaquin Valley. Now, agriculture and residential development threaten to alter more of his habitat. Oil and gas development poses the latest threat, and that's where BLM enters the picture.

BLM contracted with the California State University at Fresno to inventory the impact of oil and gas development on the rare lizard. Transect after transect was run across the suspected habitat. Now the Bureau has the tools to pinpoint important locations of the blunt-nosed lizard, and can move ahead with plans for its recovery.

Planning for Wildlife Habitat Management

In an agency that deals with long-range causes and effects, and the conflicts that may arise from the multiplicity of resource uses and demands, intensive planning is vital. A native range that naturally went from perennial grasses to sagebrush over a century of overgrazing will normally take many years to revert to grass. A Douglas fir forest, containing some old-growth trees perhaps in the 250-year age class, cannot be regarded merely as a year-to-year resource. After inventory, *planning* becomes the foundation for all management activities.

BLM prepares written resource management plans, in cooperation with other agencies of State and local and Federal governments, private citizens and public organizations.

As mentioned in the introduction, BLM manages the lands remaining after a century of land grants, land claims, and reservations for other Federal activities. In most western States, two square miles were automatically granted from each 36-square-mile township for the support of common schools.

Dave Daughtry

Gambels quail are a prized game bird on many areas of the public lands.

Bird hunters on public land in Oregon may find several kinds of quail, plus chukar, and sage grouse.

Sometimes, every other square mile was granted for railroads or wagon roads. Thus the land ownership pattern of the remaining public lands is a checkerboard, with almost countless miles of boundaries, open and unfenced.

But wildlife species know no land ownership boundaries, read no maps, follow no rules except their own requirements for survival —their needs for food, cover, space and water.

All of these considerations must be weighed as fish and wildlife habitat plans are formulated, sent out for public and agency review, and revised according to the needs and suggestions of other neighbors on the land.

Let's take a closer look at what habitat and land use plans mean for wildlife.

Again, using California's blunt-nosed lizard as an example, an inter-agency team was established to develop a recovery plan to save this endangered species.

Team members representing the California Department of Fish and Game, the U.S. Fish and Wildlife Service, the Forest Service and the Bureau of Land Management studied the facts gained from earlier inventory work and came up with a five-part plan.

They recommended efforts to save as much remaining habitat as possible, with particular emphasis on keeping up the continuity of habitat and genetic interbreeding. They cautioned against allowing genetic isolation. They recommended ways to maintain and increase the current population, suggesting that use of aerial photography would help in identifying habitat areas. They suggested additional studies on the ecology and limiting factors governing the lizard's relationship with his ecosystem. And finally, they urged public information and education programs to further public awareness of the need for preserving this endangered species.

Ed Roberts

Transplants help reestablish animals, such as the Rocky Mountain bighorn sheep at top, to ancestral homes. Below, pronghorn antelope are reintroduced to an area in Idaho.

The Rocky Mountain bighorn sheep is one of the most highly prized trophy animals in the United States; just catching a fleeting glimpse of a big ram through a pair of binoculars or the lens of a camera is a thrilling experience. In the Whiskey Mountains of Wyoming, the winter range provides for the largest Rocky Mountain bighorn herd in the country.

Efforts of three agencies have been involved in planning for management of this winter range: the Bureau of Land Management, the Forest Service, and the Wyoming Fish and Game Department. The management programs planned are concentrated mainly in the area between Torrey Creek and Sheep Ridge, in a land that provides the necessary topographic, climatic, and forage condi-

Len Rue, Jr.

Mule deer, such as this magnificent buck, are found in most public land ecosystems.

tions required for winter survival of the sheep.

This is high country for most people; elevations begin at 7,500 feet and reach upward to 11,000 feet. The higher elevations are in national forests, including 5,000 acres in the Glacier Primitive Area. Lands managed by BLM are interspersed between national forests, private lands, and tracts owned by the Wyoming Fish and Game Department.

Part of the planning involves reserving all of the forage in some tracts specifically for bighorn sheep. Populations range between 850 and 900 bighorns, although since 1949 about 875 animals have been removed as transplant stock for other promising areas. But the preferred range produces only enough forage to safely support some 600 animals.

Hunting, under the supervision of the Wyoming Fish and Game Department, helps keep the animals in balance with their food supply. But the potential exists for a catastrophic die-off, if pneumonia or other disease were to spread through the herd.

Thus one key part of the plan is to keep herd numbers in balance with the habitat through hunting, trapping, and transplanting. While the Federal agencies allow some grazing of cattle and horses, study results indicate there is little conflict between these uses and wildlife.

In the BLM Las Vegas District of Nevada, planning for management of the distinctly different desert bighorn sheep is shared with the Nevada Department of Wildlife. Here, where much suitable historic habitat exists, but is unoccupied by desert bighorns for one reason or another, much of the planning involves reintroduction of the species into the habitat it once used.

BLM and State wildlife specialists jointly developed a habitat management plan, using three main tools: a reintroduction program, habitat improvements, and reduction of competition from domestic livestock and wild horses and burros. These tools are being used, area by area, in habitat management plans complete with time schedules. Given the huge area involved—more than a thousand square miles—the plan involves actions scheduled all the way to 1989.

Putting plans into action

The final step in the Bureau's fish and wildlife program process is putting plans into action. Habitat improvement actions take time—time to accomplish, and more time to produce visible results. When fishing improves a year or so after stream-bed rehabilitation, or transplanted antelope produce a crop of fawns the next year, or when an endangered species merely makes

it through another season—then the results are evident. And these results, when evaluated, provide the basis for further program efforts.

A multi-agency plan in California is beginning to produce results for the tule elk. Once, perhaps 500,000 of these animals roamed much of the State. Hardly more than a century ago the population was down to *one pair* in Kern County. By 1895, that one pair had increased to 28 individuals. A thousand tule elk now exist in 13 locations. The ultimate goal is to have 2,000 animals in free-roaming herds in California.

It was man's entry into California that nearly exterminated the tule elk. First it was Spanish cattle that ate the perennial bunch grasses. Then it was the hide and tallow market, followed by market hunting to feed the Gold Rush miners. In later years, agricultural developments and urban expansion severely reduced the elk's available habitat.

In 1976, legislation was passed to provide Federal participation in efforts to preserve and enlarge the remaining tule elk herd. Unique in the language of this legislation is the use of lands reserved for the Department of Defense for possible relocation sites. Thus the Army and the Navy are also participating, along with both the California Department of Fish and Game and the Department of Parks and Recreation.

The Bureau of Land Management reports annually to the Congress on the progress of tule elk preservation programs.

Preserving the elk involves far more than simply trapping and transplanting surplus animals from one location to another. Food, water and cover requirements must be met. In some cases, wildlife foods have been planted to help support the animals. In other cases, water developments have been added to help the elk through dry spells. But with the continued cooperation between agencies, the tule elk will thrive in California.

Gary Ferrier

John Crawford

Top: *Tule elk were almost extinct in California until cooperative efforts by State and Federal agencies brought them back.* Bottom: *Many excellent fishing streams cross the public lands.*

Birch Creek, in the BLM Idaho Falls District of Idaho, is only 20 miles long from its headwaters to the point where it disappears into an irrigation ditch, later to sink into the Snake River Aquifer. But it's a blue-ribbon trout stream—and a prime example of riparian and aquatic habitat management.

Planning for the Birch Creek project involved 256,000 acres in three counties. The population center is Blue Dome, a community of six people.

Half of the land immediately adjacent to the stream is in private ownership. The remainder is in State and Federal ownership.

Repeated use of the streambank, or riparian, vegetation by domestic livestock led to bank erosion, loss of shade, and clogging of stream channels.

Answers were on the ground and in the water. BLM helped fence the stream boundaries to keep out domestic livestock, meanwhile pro viding other water to meet the cattle's needs. BLM and Idaho Department of Fish and Game biologists installed water control structures in the stream, log dams and log water diversions to deepen the channel in places while providing resting areas for spawning and rearing of trout.

At times, drastic measures have to be taken to preserve wildlife habitat, in the face of man-made or natural threats. Take for example the only colony of white pelicans in Colorado.

The Colorado Fish and Game Department and BLM worked together to save this nesting island used by white pelicans.

Colorado Department of Natural Resources

These birds, with their majestic 10-foot wingspan, are so shy that human disturbance can cause them to abandon their nests. They prefer an island or marsh away from people and natural predators. And the adults and their young need a steady supply of fish for food.

Their requirements are so specialized that only one area in Colorado seems to meet their needs—an island in the Riverside Reservoir in northeastern Colorado.

But Pelican Island, as it has come to be known, had dwindled by 1978 to only 3.5 acres, as storm-driven waves nibbled away at the island each winter.

BLM, which manages the land, joined forces with the Colorado Division of Wildlife, the University of Northern Colorado, Colorado State University, Colorado Audubon Society, and the Colorado Wildlife Federation to save the white pelican's nesting habitat. In the fall of 1978, after the pelicans had departed their summer home, a small army of bulldozers, earth-movers and concrete trucks descended upon the island while the reservoir was at its lowest water level.

Using a concrete fabric, BLM engineers and others lined the exposed north face of the island, reinforcing it against winter wave erosion. Trees and shrubs were also planted to help stabilize the shoreline and the soil on the island. Working against time, the engineers, contractors and volunteers fought to save the island before winter snows began to refill the reservoir.

By spring, when the pelicans returned, they found their precious habitat restored, and, for now, their future assured.

Cooperation Every Step of the Way

An Idaho wildlife biologist checks a "guzzler" which provides water for wildlife on the public lands.

Idaho Fish & Game Department

Recognizing the distinction between *wildlife* management and *wildlife habitat* management, BLM as an agency is committed to cooperating with State fish and game departments—every step of the way. And with the land's intermingled ownership patterns, cooperation doesn't stop with the State departments; BLM cooperates with numerous other State and Federal and local agencies, private citizens, and citizens' groups.

The Sikes Act provides one outstanding vehicle for cooperation, since that Act provides Federal funds for certain fish and wildlife restoration projects, as well as requiring cooperative agreements between Federal land-managing agencies and State wildlife departments.

One of the first Sikes agreements entered into by BLM was with the Colorado Division of Wildlife. It covered the winter home of the largest migratory herd of mule deer in America—in the Piceance Basin of northwest Colorado. Also affected were a host of other game and nongame species that live in this high but deeply carved plateau country.

From their summer range in the Flattops Wilderness Area, some 20,000 mule deer descend to the Piceance Basin—some even before the aspen drop their golden yellow leaves in autumn.

This first agreement not only improved habitat for deer, but also benefited sage grouse, cutthroat trout, raptors and many small birds and mammals.

Wildlife habitat, and the future of this splendid deer herd and other

wildlife that roam this land, will depend on continued cooperation between the Bureau and the Colorado Division of Wildlife. For here, in the Piceance Basin, just under the cloak of aspen and sagebrush, lies the world's largest reserve of oil shale—a source of future energy that is becoming more and more attractive.

In Arizona, a 100-mile stretch of the Gila River, from Phoenix to Date Palm, has become a conservation showplace through the cooperative efforts of BLM, the State of Arizona, private landowners, and the Arizona Game and Fish Department.

This area is known as the Fred J. Weiler Green Belt, named for the late BLM State director who was the motivating force in setting aside the public lands in the Green Belt.

Whitewing doves nest here, preferring the river bottomlands which are so scarce in this desert countryside. They arrive by the thousands from Mexico in the late spring, departing in early fall.

Thousands of other birds, waterfowl and shorebirds as well as songbirds, find food and resting cover and water during spring and fall migrations.

Gambel's quail are permanent residents, regarded by many as the most beautiful of all quail. Besides migratory and upland game birds, the Green Belt is inhabited by mule deer, bobcat, fox, coyote, raccoon and javelina. For birdwatchers, the Green Belt offers an amazing variety of desert birds attracted to the flowing water.

Inventories, plans, and field accomplishments make up the Bureau of Land Mangement's wildlife habitat management program—along with cooperation, every step of the way.

In these few pages, we have attempted to give you a brief picture of what the Bureau is planning and doing, and why. But dry words and printed photographs can tell only a part of the story. If you have the opportunity to drop into a BLM field office, the door is open. Come in, and ask about specific plans and programs. And, best of all, take a copy of those plans and go see for yourself.

Federal Policies and Wildlife Habitat Management

The Bureau of Land Management has passed several milestones along its way toward a modern wildlife habitat management program. Many of these milestones have come within the past decade, as more and more lawmakers, administrators, and concerned public citizens have become more aware of the importance of our environment.

The earliest of these milestones was the Taylor Grazing Act of 1934, which established the Grazing Service as a temporary custodian of the public lands, "pending their ultimate disposition." While giving most of its attention to domestic livestock, this Act did require that some forage be set aside for wildlife. For the next 42 years, this was to be the only legal basis for BLM's public land management for wildlife.

The Grazing Service was combined with the General Land Office in 1946 to form the Bureau of Land Mangement, giving the new bureau custodial responsibility for some 450 million acres of public lands. But it was not until the 1960s that professional wildlife biologists became a regular part of the Bureau's management staff.

By 1969, it became obvious that Federal administrators throughout the government were making piecemeal decisions, with neither the practical means nor the legal obligation to consider related environmental impacts. A dam could be built here that would destroy the habitat of a rare species of fish, or a highway could be built across the migration route used by big game animals when moving between summer and winter ranges.

Thus, the National Environmental Policy Act of 1969 came into being. It requires decision-makers to consider all of the impacts of a course of action, and to share their information with the public. One of the first major tests of this act was the application for a Federal right-of-way permit for the Trans-Alaska Pipeline across BLM-administered lands in Alaska.

The National Environmental Policy Act led the Bureau to extensively inventory fish and wildlife on the public lands, giving special attention to threatened and endangered species. The inventory work coincided with a new comprehensive land-use planning process that included other land and water resources as well.

Congress had already taken special note of the needs of threatened and endangered species by passing the first Endangered Species Act in 1966. This legislation required all Federal land managers to give threatened and endangered plants and animals special consideration, and to take steps to protect the habitat of those living on Federal lands.

The 1960 Sikes Act was amended in 1974 to authorize BLM and State wildlife agencies to develop conservation and rehabilitation programs on BLM-administered lands. Since 1974, BLM has established cooperative habitat management programs in 16 states, covering 20 million acres of land and some 1,500 miles of streams.

And, in 1976, Congress enacted the Federal Land Policy and Management Act, directing that BLM manage the public lands for multiple uses. The act also directed that fish and wildlife be treated as one of the principal or major values of the public lands. The act represents the first major step in modernizing the public land laws since the passage of the Taylor Grazing Act in 1934.

The Public Rangelands Improvement Act of 1978 was aimed at financing many range improvement projects on BLM administered lands. These projects will all produce many benefits for wildlife species while improving the total rangeland environment.

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Cover photo: Bald eagle by Rusty Boegeman
Inside cover photo: Canada geese by David Hefferman
Back cover photo: Coyote by James Tallon